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INTERPROVINCIAL MIGRATION AND SUICIDE IN CANADA, 1971-78

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ABSTRACT

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This study corraborates the findings by Stack (1980) on the relationship between interstate migration and suicide. The present application is to Canada during the early and later parts of the 1970s decade. Strong support for a migration effect emerges, thus supporting the culture shock hypothesis that because migration involves the concomitant processes of severing important social ties with the origin, and adjusting to a new environment, provinces characterized by high rates of migration will experience high rates of suicide. It is found that while a province's percent university educated is negatively related to suicide, the main effect of migration acts to raise the odds of suicide, but this effect is lower in magnitude than the education measure. A one percent gain in the education index would serve to lower the suicide rate by 1.3%, while a similar change in migration would increase the rate of suicide by .67%.

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INTRODUCTION

Recently, in a series of articles, Stack (1980a; 1980b; 1981) has observed that the rate of migration for a given ecological area has an important bearing on the risk of suicide. For example, it was discovered that the effects of interstate migration on suicide among the 50 American States serves to raise the rate of suicide even after relevant controls are held constant in a multivariate regression analysis. The interpretation for these results is given by Stack (1980a:22) as follows: "The results provide the strongest support for the culture shock approach ... the stress, frustration, and feelings of uprootedness associated with long distance migration contribute not only to suicide among international migrants, as found in previous studies, but also among interstate migrants."

The purpose of this study is to provide a replication of Stack's (1980a) analysis; but for the Canadian case. It may be that his findings for the American States are not generalizeable to other countries. On the other hand, it will be an important confirmation for the culture shock thesis if the association between long distance migration and suicide obtains in Canada as well. Also, the present study is a contribution to the growing literature concerning suicide and social integration (Durkheim, 1951). A direct test of social integration and its effect on suicide is not possible given the highly abstract nature of this construct. Therefore, as proposed by Gibbs and Martin (1958), and recently Gibbs (1982), a fruitful empirical approach is to explore measures of status integration and their empirical links to the rate of suicide. Migration, as an index of culture shock, may be viewed as one indicator of social disintegration -- the opposite of social integration. Inherent in the culture shock thesis is the notion that migrants to a new locality (especially a

distant one from the origin), lose important and socially meaningful ties, thus integration, with their communities of origin. The "shock" at the place of destination derives in part from this severing of ties with significant others in place of origin plus the additional effects of the adjustment process associated with relocation.

Reviews of the literature by Stack (1980a; 1982), and by Lester (1983), suggest that in many occasions, at both the state level and at the international context (cf. Kushner, 1984), a positive association between migration (often measured as the proportion that is migrant, or foreign in a given locality), and the rate of suicide obtains. Given the importance of internal mobility in advanced societies such as Canada and the United States (Parsons, 1959; Leslie, 1982; Lee, 1966; Lansing and Mueller, 1973; McInnis, 1971; Thomas, 1938; Berardo, 1967; Hendrix, 1976), it becomes important to examine not only the positive derivations of this phenomenon, such as labour market gains and upward social mobility, but also the potential disruptive consequences as well that may be associated with an increasing rate of population relocation in society (Rahe, 1979; Labovitz and Brinkerhoff, 1977; Horwitz, 1984); Miley and Micklin, 1971). The hypothesis being evaluated is that the greater the interprovincial immigration rate, the greater the province's suicide rate.

In Canada, there are significant provincial patterns of suicide and interprovince migration. Suicide follows largely an east-to-west pattern, with the eastern provinces generally having low rates, while the west region and the two northwestern territories (Yukon and Northwest Territories), demonstrating relatively high rates of self-destruction. The Rank Order Correlation Coefficient between suicide in 1971 and 1978 was calculated to be .80, suggesting a high degree of temporal stability in the regional pattern during the 1970s.

Concerning migration, some areas of Canada have historically experienced net gains, while others have shared net losses. This situation has prevailed in the case of international and internal migration as well (cf. George, 1971; Stone, 1969). The traditional pattern associated with interprovincial migration in Canada shows that the Atlantic provinces have relatively low immigration rates while Ontario, Alberta, British Columbia and Quebec have been dominant attraction areas for Canadians. The east-to-west pattern observed for the suicide rate generally prevails in the case of interprovince migration as well, but it is not linear in that the progression from east to west is not uniform. Therefore, a logrithmic transformation of this variable will become necessary in the analysis which follows. (Tables of the migration and suicide rates not included, but available on request).

VARIABLES IN THE ANALYSIS

The aim of this inquiry is to test the empirical linkage between interprovince immigration and suicide in Canada during the 1970s. The dependent variable is the age standardized death rate observed two points in time, 1971 and 1978. Since this measure is standardized, it is not necessary to include an age compositional variable in the multivariate analysis. It is assumed that this variable is an adequate index of provincial suicide rates as it consists of a summary of a population's overall mortality experience from this cause. An important consideration concerning our dependent variable is its degree of accuracy. It is often claimed by analysts that even official suicide statistics may be flowed to some degree due to underreporting. In fact, an evaluation by Brown (1975) of the Canadian data during the early seventies suggests that the official published rate should have been two to three points higher if underreporting is considered in the calculations. Given our inability to control for such a possible source of bias, we must interpret the results of

this study with some degree of caution. However, an assessment of the reliability of official suicide statistics by Gibbs (1971) suggests that by and large, the data are usually quite reliable.

The migration variable is measured as the number of interprovincial migrants to a given province divided by the receiving population. The rate is expressed per 100 population. Information for this computation was drawn from the Public Use Sample Tapes of the 1971 Census of Canada, and from official Statistics Canada publication for 1978 (Statistics Canada, 1980). In accordance with the culture shock thesis, migration is assumed to capture the disruptive effects of long distance mobility (cf. Stack, 1980a). The appropriateness of our migration measure, as an index of long distance effects, may be challenged as a certain number of interprovincial moves involve relocation between contiguous provinces (e.g., from Alberta to British Columbia). On the other hand, the evidence clearly demonstrates that a great number of migrants in Canada do indeed relocate from non-contiguous provinces towards the attraction poles of Ontario, British Columbia, Alberta and Quebec (Stone, 1969; George, 1971). Even in the case of mobility between contiguous provinces, distance per se may be of secondary importance in the context of the culture shock hypothesis because usually the crossing of sociopolitical boundaries (e.g., between provinces) involves adjustment to 'psychological distance' which is not neccessarily perfectly correlated with geographic distance (cf. Goldscheider, 1971). Therefore, even the relocation between two contiguous provinces may pose considerable 'shock' for the migrant. It is in this sense that migration is linked to suicide.

As a means of testing the relationship between migration and suicide, a multiple regression analysis is performed involving controls for two other variables, the percent Roman Catholic and the proportion university educated in a given province.

The first conditioning variable, percent Catholic, is taken from the literature concerning the relevance of cultural socialization differences on suicide risk. For example, it has been deemonstrated that blacks in the United States tend to possess low odds of suicide mortality because of their subcultural orientation toward the externalization of aggression as opposed to intrapunitive forms of aggression such as suicide (Gold, 1958; Hendin, 1969). Concerning Catholics, sociologists, starting with the work of Durkheim (1951), have viewed this religious group as being a low risk population with respect to suicide. Their internalization, through socialization, of the Catholic doctrine, which has emphasized the act of self-destruction as an unpardonable sin, is considered as an important integrative force against self-destruction. The prediction, therefore, is that the higher the percentage of a province's population that is Catholic, the lower the suicide rate.

The education variable is applied in the analysis because it is generally an index that captures socioeconomic variables such as income and occupational specialization. The literature in the context of socioeconomic position and suicide mortality suggests an inverse relationship between these two variables (cf. Gibbs, 1966; Maris, 1969; Platt, 1984; Stack, 1982; Barnes, 1975; Horwitz, 1984). For example, in the study by Stack (1980a), median family income was found to be negatively associated with state variations in suicide during the early 1970s. Presumably, the higher the socioeconomic standing of a province, the greater the overall well-being of the population, and hence the lower the rate of self-destruction.

The inclusion of education in the multivariate analysis is important because it may be that it accounts for both suicide and migration thus possibly making the apparent association between suicide levels and immigration rates a spurious correlation. Multiple regression analysis will allow us to control for

such a possibility. It is known that the more developed areas of a country tend to have a better educated population than places characterized by low levels of social and economic development. Also, the more advantaged localities attract the majority of migrants in search of opportunities. Moreover, suicide rates tend to increase within places where a large number of migrants settle. This last interpretation is more consistent with a chain causal relationship: education affects migration, while in turn, migration leads to variation in suicide. This is an alternative relationship to the possible spurious association mentioned earlier. The regression analysis will help to check these possible interrelationships.

Before we proceed to a discussion of multivariate results, one further note is in order. Since this study examines suicide rates for two points in time, 1971 and 1978, among 12 provinces, the number of observations is actually 24. In order to maintain 24 observations as opposed to only 12 if the analysis were to be executed for the two periods separately, the variables, dependent and predictor, were residualized for temporal change. Thus a series of bivariate regressions were executed involving each variable regressed on time separately. The time residualized variables were used in the final multiple regression analysis. In actuality, time was observed to account for a minimal amount of variation in the variables.[1]

ANALYSIS

Table 1 shows the intercorrelation matrix, means and standard deviations for the variables included in this study. Concerning suicide, all the variables, with the exception of migration, conform to the hypothesized predictions. However, the logrithm of migration is not statistically significant in its association with the dependent variable. Since this is only a zero order relationship, the possibility of suppressor effects cannot be

TABLE 1. INTERCORRELATION MATRIX, MEANS AND STANDARD DEVIATIONS FOR THE VARIABLES IN THIS STUDY

VARIABLES		(1)	(2)	(3)	(4)
Suicide	(1)	1.000	-.071	-.599*	-.297**
Ln Inmigration	(2)		1.000	.598**	-.088
% Unived	(3)			1.000	.020
% RC	(4)				1.000
X		15.26	1.601	9.53	38.49
S.D.		10.57	1.320	4.27	18.09

* Significant at .01 level.

** Significant at .05 level.

altogether discounted; it may turn out that the sign may actually reverse, and the effect become significant, once all predictors are simultaneously controlled for. The correlations in the table would, at this stage of the analysis, lead to the conclusion that if we are to explain provincial differences in suicide during the seventies in Canada, educational and religious compositional differences are of primary relevance, not immigration differences.

Table 2 presents the multivariate results. As demonstrated in the tabulation, percent university educated and differences in the logrithm of interprovince mobility are both significant predictors of provincial differences in suicide propensities. The religion variable fails to reach statistical significance. Overall, the equation explains 55 percent of the explained variance in the dependent variable (adjusted R^2=.48). Given these results, it seems that the most likely model that elaborates the relationship between education, migration, and suicide is the causal chain model discussed earlier, but with the important qualification that both migration and suicide are linked to education as well. In fact, the indirect influence (standardized Beta) of percent university educated on suicide through migration is +.294. This suggests that while a highly educated population lowers the risk of self-death in a given ecological area, the combination of this with an increasing flow of newcomers leads to increments in the incidence of suicide. The substantive interpretation of this may be stated within the social disorganization perspective. If we allow for the use of education as proxy for the socioeconomic standing of a province, the higher the socioeconomic position, the greater the attraction to migrants as a place to find opportunities for socioeconomic expansion. Furthermore, places that are highly developed economically are also generally characterized by rapid social change, which is known to influence anomie and consequently increases in suicide. The indirect

TABLE 2. MULTIPLE REGRESSION ANALYSIS OF THE PROVINCIAL SUICIDE RATE IN CANADA, 1971-78

VARIABLE	b	S.E.b	t	B	CONTRIBUTION TO OVERALL R^2
Ln Inmigration	6.30440	2.923	2.160	.410**	20%
% Unived	-2.05822	.464	-4.439	-.839*	34%
% RC	-.14273	.089	-1.610	-.244	1%
					TOTAL = 55.0
Intercept	-32.81738				
R^2	.55				
Adjusted R^2	.48				
F Regression	8.006*				
d.f.	3/20				

* Statistically significant at the .01 level.

** Statistically significant at the .05 level.

effect of education, through migration, on the suicide rate is an indication of this phenomenon. However, it must be emphasized that this remains only a tentative conclusion due to the indirectness of the empirical test. This issue remains open for further study. In any event, we saw that provincial differences in migration flows and university education, are significant predictors of provincial variation in the rate of suicide. Although we agree with Wasserman (1984) that individual level relationships cannot and should not be drawn from ecological level relationships, we propose, as did Stack (1980), the "shocks" associated with migration lead to increases in the incidence of suicide due to the combined effects of severing important social ties with the community of origin, and the stresses associated with the migration adjustment process in the area of destination.

The equation in Table 2 shows that the proportion of a province's population that is Roman Catholic does not contribute toward an explanation of regional differences in suicide in Canada. Therefore, no support for the differential socialization thesis is provided in this research. Perhaps, as mentioned by Stark and his associates (1983), a better indicator of a religion effect would be religiosity because denomination per se has declined in its importance in differentiating social behavioural differences, especially suicide.

The relative importance of the variables in determining suicide differences may be gained by examining the Beta weights in the equation in Table 2. Furthermore, as suggested by Stack (1980a), the elasticity coefficient may be applied to ascertain the extent to which a one percent gain in either education or immigration would translate into a percent change in suicide. The results from such computations lead us to conclude that for the 1970s, a one percent change in education would have accounted for a 1.3 percent decline in the

suicide rate, while the same increment in migration flows to a given province would have served to raise the suicide rate by .67 percent.

CONCLUSION

We started with the proposition that provincial differences in suicide are related to provincial differences in the flow of migration. Following Stack (1980a), we provided a test of the culture shock hypothesis by relying on migration as an index of the disruptive consequences associated with relocation. Although it is not possible to orovide individual level relationships from aggregate ecological data, the results derived from this study suggest that migrants to a given province contribute to increasing the suicide rate of the receiving province because they suffer from culture shock, which involves severing important social ties with the community of origin, and also increasing social psychological stresses associated with adjustment to a new environment. The study is further confirmation for the Durkheimian theory of social integration and suicide. In the present context, the focus was on one dimension of the social integration phenomenon -- the social disintegrative effects associated with long distance migration. The findings for Canada, in the context of the 1970s decade, corraborate the results derived by Stack (1980a) in the United States; thus establishing further proof that while relocation in the advanced societies may have enhancing effects overall, one serious correlate of this process is an increasing risk of suicide.

FOOTNOTES

1. The time-variable equations are shown below; they were used to derive the residualized variables in the multiple regression analysis net of the time effect. An advantage of this procedure is that it allows for one less variable in the multivariate equation thus minimizing the odds of obtaining chance results when the number of predictor variables approximates the number of observations. Since N=24, this consideration is an important one.

DEPENDENT VARIABLE IN THE BIVARIATE REGRESSION	(a)	(b)	(r)	R^2
Log Migration	3.01667	-.11833	-.101	.0100
% University Educated	9.64417	-.23500	.028	.0008
% Roman Catholic	36.09000	4.79750	.135	.0180
Age Standardized Suicide Rate	13.84167	2.83333	-.137	.0190

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